Manufacture of Sintered Carbide Blanking Dies SOV/3673

carbide dies for blanking stator plates and other elements of electrical equipment. No personalities are mentioned. There are 6 references: 5 Soviet and 1 German.

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VEDENEYEV, Nikolay Petrovich; VOLCHENKOV, Aleksandr Ivanovich; NOVGORODOV, Aleksandr Stepanovich; ONIKUL, Ya.Ye., inzh., retsenzent; VAYNTRAUB, D.A., kand. tekhn. nauk, red.; LEYKINA, T.L., red. izd-va; SPERANSKAYA, OV., tekhn. red.

[Hard-alloy engineering equipment; dies and press-molds] Tverdosplavnaia tekhnologicheskaia osnastka; shtampy i press-formy. Leningrad, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1961. 119 p. (MIRA 15:2)
(Dies (Metalworking)) (Metalwork)

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[Hard-alloy blanking dies] Tverdosplavnye vyrubnye shtampy. Leningrad, 1960. 30 p. (Leningradskii dom nauchno-tekhnicheskoy propagandy. Obmen peredovym opytom no.18, Seriia: Kholodnaia shtampovka, vyp.2). (MIRA 14:1)
(Punching machinery)

VEDENEYEV, Nikolay Petrovich; VOLCHENKOV, Aleksandr Ivanovich; KORSAKOV, Vasiliy Dmitriyevich; ACHKINADZE, Sh.D., inzh., red.; GVIRTS, V.L., tekhn.red.

[Punching dies reinforced with hard alloys and their manufacture] Vyrubnye shtampy, armirovannye tverdym splavom, i tekhnologiia ikh izgotovleniia. Leningrad, Leningr.dom nauchno-tekhn.propagandy, 1958. 65 p. (Informatsionno-tekhnicheskii listok, no.28-31. Elektricheskie metody obrabotki materialov). (MIRA 12:4)
(Punching machinery)

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(Riga--Stencil work)

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Suggestions for changing the standard designs for water pipes.
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MATVEYEV, K.V., kand. tekhn. nauk; MUROMOV, V.S., kand. tekhn. nauk;
VOLCHENKOV, G.Ya., inzh.

Power damping and erosion in tailrace culverts. Trudy MIIT no.176:34-52 '63. (MIRA 17:6)

BEGAM, L.G., kand.tekhn.nauk; VOLCHENKOV, G.Ya., inzh.; NIKOLAI, K.V., inzh.

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Anisotropy of some physical properties of calcite. Vest.Mosk.un. Ser.4: Geol. 17 no.5:44-49 S-O '62. (MIRA 15:11)

1. Kafedra mineralogii Moskovskogo universiteta.
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Automation of irrigation systems. Izv. AN Kir. SSR. Ser. est. i tekh. nauk 4 no.8:117-124 '62. (MIRA 16:6)
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Effect of medicinal sleep on certain manifestations in experimental burns in dogs. Khirurgiia, Moskva no. 12:12-18 Dec 1952. (CLML 23:3)

1. Of the Department of General Surgery (Director -- Prof. V. A. Batashov) and the Department of Pharmacology (Director -- Docent G. M. Shpuga), Ivanovo Medical Institute.

DARPACHEV, S.V.; SMIRNOV, M.V.; VOLCHENKOVA, Z.S.

Adsorption of steam on mercury. Zhur.fiz.khim. 27 no.8:1228-1235 Ag '53. (MLRA 6:11)

1. Institut khimii i metallurgii Ural'skogo filiala Akademii nauk SSSR, Sverdlovsk. (Adsorption) (Mercury)

Volchenkova, Z. S.

Chemical Abst.
Vol. 48 No. 6
Mar. 25, 1954
Electrochemistry

The work function of mercury in an atmosphere of water vapor. S. V. Karpachev, K. V. Sinitsyn, Z. S. Volchenkova, and G. K. Stepanov. Inst. Chem. and Electrochem. Ural Branch Acad. Sci. U.S.S.R., Sverdlovsk. Zhur. Fiz. Khim. 27, 1370-3(1953). cf. C.A. 42, 1196e. The work function of Hg in the presence of H_2O vapor for thin [illegible] and H is greater than in vacuo owing to the adsorption of H_2O to less than 15 [illegible] molecules/sq. cm. the difference has a maximum of 1.1 v. which is too great to be accounted for by the orientation of adsorbed H_2O dipoles. The p.d. between Pt in vacuo and Pt in H_2O vapor (whose pressure varied from 5×10^{-6} to 2×10^{-3} mm. Hg) is independent of the vapor pressure and decreases from 0.47 v. at 150° to 0.1 v. at 351° and zero at 550°. J. J. Bikerman

Volchenkova, Z.S.

578

AUTHOR: Smirnov, M.V. and Volchenkova, Z.S.

TITLE: Equilibrium Potentials of Carbon-Dioxide Electrodes of Beryllium in Fused Chlorides. (Ravnovesnye Potentsialy Okisnougol'nykh Elektrodov Berilliya v Rasplavlennykh Khloridakh.)

PERIODICAL: "Zhurnal Neorganicheskoy Khimii" (Journal of Inorganic Chemistry) Vol.II, No.2, pp.417-421. (U.S.S.R.) 1957

ABSTRACT: From data in the literature the e.m.f. of the cell BeO + C | $BeCl_2$ liquid | Cl_2, C should be given by the formula

$$0.441 - 1.5 \times 10^{-4} T.$$

Because of the very low conductivity of fused beryllium chloride a direct measurement of e.m.f. could not be made, and for this reason the investigation described was limited to measuring the e.m.f. of cells with chlorine and carbon-dioxide electrodes of beryllium in fused equimolar mixtures of sodium and potassium chlorides, containing from 0.064 to 7.35 wt. % $BeCl_2$. It was found that the e.m.f. of this cell changes with temperature and mol.-fraction of beryllium ion concentration in the melt according to the empirical equation:

$\varepsilon = (-0.044 + 6.25 \times 10^{-4}T - 0.992 \times 10^{-4}T \log. [Be^{2+}] [Cl^-]^2 - 0.992 \times 10^{-4} T \log. f_{Be^{2+}} f^2_{Cl^-})$ volts, where $[Be^{2+}]$ and $[Cl^-]$ are the molar fractions, while $f_{Be^{2+}}$ and f_{Cl^-} are the

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Equilibrium Potentials of Carbon-Dioxide Electrodes of Beryllium in Fused Chlorides.(Cont.)

activity coefficients of beryllium and chlorine ions in the melt. Carbondioxide electrodes of beryllium were found to be reversible with respect to its ions in chloride melts. At low $BeCl_2$ concentrations the melts behave like ideal solutions. From the experimental data and those obtained in the literature the change in the isobaric potential on transition from pure liquid $BeCl_2$ to its dilute solutions in melted eutectic mixture of sodium chloride and potassium chloride was calculated to be 22,400 - 39.53 T cal. per mol. $BeCl_2$. Mixing the fused salts was found to be endothermic and to be accompanied by increase in entropy.

There are ten references, two of them Russian.

There are 2 Figures.

Work was carried out at the Ural branch of the Academy of Sciences, U.S.S.R., Electrochemical Laboratory.

Received 29 October, 1956.

Card 2/2

137-1958-2-2646

Volchenkova, Z. S.

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 63 (USSR)

AUTHORS: Smirnov, M.V., Pal'guyev, S.F., Volchenkova, Z.S.

TITLE: The State of the Oxygen in Salt Melts Containing Titanium (O sostoyanii kisloroda v solevykh rasplavakh soderzhashchikh titan)

PERIODICAL: Izv. Vost. fil. AN SSSR, 1957, Nr 3, pp 94-101

ABSTRACT: On the basis of experimental data on the electrolysis of fluoride/chloride melts containing Ti^{4+} it was shown that the effect of the atmospheric O_2 within them and the suspended insoluble dioxide led to the formation of oxy-cations of the TiO^{2+} and $Ti_2O_3^{2+}$ type, which when discharged at the cathode yield well formed crystalline precipitates of the lowest Ti oxides. These oxides were precipitated with potentials 1.3 - 1.4 volts more positive than the potential used to segregate metallic Ti, and 2.2 - 2.3 volts more positive than the potential used to segregate an alkali metal. Tests were made to clarify the nature of the processes which take place at the cathode and at a carbon anode when electrolysis occurs with small current densities. It was found that the reduction of Ti^{4+} to the lowest valences at the cathode was

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137-1958-2-2646

The State of the Oxygen in Salt Melts Containing Titanium

accompanied by the discharge of oxy-cations with the formation of precipitates of the lowest Ti oxides. At the anode, simultaneously with the oxidation of the lowest-valence Ti, an electrochemical reaction took place with the oxy-cations adsorbed on the carbon: $TiO^{2+} + 1/2\,C - 2e = Ti^{4+}$ (melt) + $1/2\,CO_2$. Chlorination reactions involving the particles of TiO_2, Ti_2O_3, and TiO suspended in the melt were also possible. The anode potential during these processes was $\sim$0.4 volts more negative than the potential of a chlorine electrode.

N.P.

1. Fluoride melts—Electrolysis 2. Chloride melts--Electrolysis
2. Oxygen—Determination

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VOLCHENKAYA Z S

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SOV/81-59-13-45035

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 13, p 44 (USSR)

AUTHORS: Smirnov, M.V., Ivanovskiy, L.Ye., Pal'guyev, S.F., Volchenko, Z.S., Yushina, L.D.

TITLE: The emf-Method for Studying the Thermodynamics of Some Reactions at High Temperatures

PERIODICAL: Tr. in-ta khimii. Ural'skiy filial AS USSR, 1958, Nr 2, pp 143 - 151

ABSTRACT: In the electrolysis of fused chloride baths CO_2 is separated on the anodes prepared from an intimate mixture of oxides and carbon and the ions of the corresponding metals pass into the electrolyte. The oxide-carbon electrodes of thorium, calcium, beryllium, etc. in equilibrium are reversible in relation to their ions being in the electrolyte. This permits to utilize them by the emf-method for elucidating the thermodynamics of reactions, in which oxides and carbon take part at high temperatures. The equilibrium potentials of the electrodes are determined by the activity of the ions of the corresponding metals in the electrolyte and by the CO_2 pressure over them according to the electrode reaction $M_2O_n + n/2C - 2ne \rightleftarrows 2M^n + (\text{fusion}) + n/2CO_2$, E =

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The emf-Method for Studying the Thermodynamics of Some Reactions at High Temperatures

const + (RT/n) $Flna_M n$ + (RT/4F) $\ln P_{CO_2}$. They do not depend on the molar ratio of CC and carbon. By measuring emf the changes can be found in the isobaric potential ΔZ, in the entalpy ΔH and entropy ΔS of the corresponding reactions of chlorination $M_2O_n + n/2C + nCl_2 = 2MCl_n$ (smelt) + $n/2CO_2$. Oxide-carbon electrodes in combination with metal electrodes made it possible to study the thermodynamics of the interaction of the fused chlorides of thorium, beryllium and calcium with the chlorides of the alkali metals. For determining the decomposition tension of the fused chlorides of higher valencies a method has been developed permitting to measure the value of the decomposition tension of $PlCl_2$ and $ThCl_4$. The change in the thermodynamic parameters has been calculated for the reaction Th (solid) + $2Cl_2$ (gas) = $ThCl_4$ (liquid), $\Delta Z = 2.772 - 5.61 \cdot 10^{-4} T$. Based on the emf of the cell Th | $ThCl_2$ ‖ KCl, $ThCl_4$ | Cl_2, C, it has been found for the decomposition tension of $ThCl_2$; $E = 3.27 - 10.8 \cdot 10^{-4} T$, $\Delta Z = 150,900 + 49.7T$ cal/mole. For the reaction $ThCl_4$ (liquid) + Th (solid) = = $2ThCl_2$ (liquid), $\Delta Z = - 23,000 + 23.8T$ cal/mole $ThCl_2$. The thermodynamics of the formation of alloys of thorium with zinc has been studied. For the reaction of reducing ThO_2 by carbon to metal $\Delta Z = 20,000 - 77.5T$ cal/mole.

A. Zolotarevskiy

Card 2/2

67625

SOV/81-59-14-50212

5.1310(B)

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 14, p 318 (USSR)

AUTHORS: Pal'guyev, S.F., Volchenkova, Z.S.

TITLE: The Problem of a Solid Electrolyte for Fuel Elements

PERIODICAL: Tr. in-ta khimii. Ural'skiy fil. AS USSR, 1958, Nr 2, pp 183 - 200

ABSTRACT: A method of preparation has been described and results are cited of measurements of the electric conductivity of solid electrolytes for fuel elements: a) O.K. Davtyan's electrolyte and its individual components (Na_2CO_3, calcined monazite); b) a series of mixtures of oxides on the base of zirconium dioxide: 60 molar % ZrO_2 + 40 molar % CeO_2; 67.7 molar % ZrO_2 + 33.3 molar % La_2O_3; $3ZrO_2 \cdot 2CeO_2$ + 10 weight % CaO. The measurements of electric conductivity were carried out by the impedance-bridge method at a frequency of 1,000 cycles. The circuit permitted the determination of the resistance with an accuracy of 1 - 10%, depending on the value of the measured resistance. The conductivity was measured in a range of temperature from room temperature to 1,000°C. The activation energies were calculated from the curve of the electric conductivity versus

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67625

The Problem of a Solid Electrolyte for Fuel Elements SOV/81-59-14-50212

1/T (T is the absolute temperature) for sections with different slopes. On the basis of the obtained data assumptions are made concerning the character of the electric conductivity of oxide systems. There are 30 references.

4

P. Lukovtsev

Card 2/2

SOV/58-59-8-18207

Translated from: Referativnyy Zhurnal Fizika, 1959, Nr 8, p 168 (USSR)

AUTHORS: Volchenkova, Z.S., Pal'guyev, S.F.

TITLE: The Temperature Dependence of the Electrical Conductivity of Nickel and Chromium Oxides

PERIODICAL: Tr. In-ta khimii. Ural'skiy fil.-AN SSSR, 1958, Nr 2, pp 201-207

ABSTRACT: The temperature denpendence of the electrical conductivity (σ) of polycrystalline samples of NiO and Cr_2O_3, sintered at 1,550°C, was studied in the interval of 150 to 900°C. σ was measured by means of the contact method with the aid of an alternating current bridge at a frequency of 1 kc. Contact resistances did not affect the temperature dependence of σ. It was established that σ for NiO, unlike Cr_2O_3, increases sharply with an increase in the quantity of adsorbed oxygen, while the activation energy of the conductivity of NiO, measured on rectilinear sections, decreases. In the case of Cr_2O_3 the activation energy of σ falls with an increase in temperature. The absence of ionic conductivity under the conditions of the experiment was established by means of a chemical analysis of the areas near the electrodes.

E. Yenikeyev

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05878

SOV/78-4-11-31/50

5(2)

AUTHORS: Pal'guyev, S. F., Alyamovskiy, S. I., Volchenkova, Z. S.

TITLE: Investigation of the Phase Components of the System CeO_2-ZrO_2

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 11, pp 2571 - 2576 (USSR)

ABSTRACT: This is a report on the structure and the ceramic properties of the system CeO_2-ZrO_2. The samples were prepared from mixtures of pure oxides. The spectroscopically determined content of impurities in the initial substances is given in table 1. The powders were pressed, a binding agent (natural rubber in benzene) being used for samples with more than 80% ZrO_2. The samples were then sintered and X-ray investigated with copper K_α-radiation (powder camera of type RKD and inverting camera of type KROS). Besides, the density, color and linear shrinking (Fig 2) in sintering were determined. Table 2 gives the chemical composition, the phase composition, the lattice constants, and the color of the samples. A solid solution with cubic lattice develops between 0 and 50 mol% ZrO_2, a monoclinic phase exists between 0 and 10 mol% CeO_2, a tetragonal phase at 70 mol% ZrO_2. Figure 1 shows that the lattice period changes

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Investigation of the Phase Components of the System CeO_2-ZrO_2

05878
SOV/78-4-11-31/50

linearly with the composition and exhibits statistically distributed lattice defects which are probably situated in the lattice points occupied by the Ce^{4+}- and O^{2-}-ions. The samples with 70 mol% ZrO_2 have the greatest hardness; linear shrinking exhibits a minimum at 20-25 mol% ZrO_2; the samples with 10-20 mol% ZrO_2 are most intensely colored. A vigorous interaction between the two components seems to take place in this range (between 10 and 30 mol% ZrO_2). This interaction cannot be determined by X-ray investigation, it should, however, become manifest in the electric properties. There are 2 figures, 4 tables, and 3 references.

ASSOCIATION: Ural'skiy filial AN SSSR, Institut elektrokhimii (Ural Branch of the AS USSR, Electrochemical Institute)

SUBMITTED: June 5, 1958

Card 2/2

31675
S/631/60/000/001/013/014
B110/B102

24.7700

AUTHORS: Volchenkova, Z. S., Pal'guyev, S. F.

TITLE: Electrical conductivity of solid oxide systems. II. The system ZrO_2 - CaO. Electrical conductivity and transfer number

SOURCE: Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov, no. 1, 1960, 119 - 126

TEXT: The authors studied the temperature dependences of the conductivities of 100% ZrO_2 - 100% CaO samples between 300 and 1000°C, the transfer numbers, the structural properties of sintered samples, and their ceramic properties. Pure ZrO_2 and CaO or $CaCO_3$ were kept at 1200°C for 2 hrs. For samples with < 40 mole% CaO the authors used CaO, for those with > 40% CaO, they used $CaCO_3$. The mixture (200 mesh grain size) was pressed to 1.0·1.0·0.2 - 0.4 cm tablets at ~4000 kg/cm^2, and sintered for 1 hr at 1500 ± 20°C. Linear shrinkage during sintering, properties, and color were determined. G. V. Burov made X-ray structural analysis of the

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specimens with CuK_{α} radiation. At 1500°C, solid solutions and fluorite-type crystal lattices formed with 10 mole% CaO. The primary solid solution (10.0 - 40.0 mole% CaO) yields good ceramics of high density, hardness, and stability in air. Free CaO contained in samples with 80.0 - 90.0 mole% CaO reacted with atmospheric humidity. The porosity and sample volume of zirconate formed according to $ZrO_2 + CaO \rightarrow CaZrO_3$ increases while its linear shrinkage decreases. The temperature dependences of conductivities measured with a-c bridges followed the equation $\varkappa = A \exp(-\Delta E/2kT)$ where $\varkappa$ is the conductivity, A and ΔE are constants. At 750 - 800°C, the curve showed a break (except for the range where solid solutions are formed). X-ray patterns of samples with >50 mole% CaO showed CaO lines. $\varkappa$ was increased by the formation of $Ca(OH)_2$ and CaO_3 and decreased by their decomposition (700 - 800°C). The rapid increase of $\varkappa$ with the CaO content in the range of formation of solid solutions is probably due to an increase in oxygen vacancies in the lattice. With increased CaO content, the defects are no longer distributed statistically but systematically. The mobility of oxygen ions is thus reduced. With 15 mole% CaO, the conductivity maximum was observed at the minimum conductivity activation energy ΔE. The

Electrical conductivity of solid...

increase of linear shrinkage with the number of vacancies is probably due to the existence of oxygen vacancies only. $CaZrO_3$ had a κ minimum and a ΔE maximum. The second, smaller κ maximum at 60% CaO is probably due to the formation of the $CaZrO_3$ - CaO eutectic. Another small κ minimum was observed at 90% CaO. The transfer number was determined from the weight losses. Three oxide plates 3 - 4 mm thick and 20 mm in diameter were used as catholyte, central piece, and anolyte. They were ground on each other, pressed between Pt electrodes, heated to 1000°C, and electrolyzed at 0.02 - 0.03 a for 2 - 4 hr. The transfer number was calculated as follows: $t_k = (\Delta a \cdot 1.19)/AB$ and $t_a = (\Delta k \cdot 1.19)/AB$, where t_k and t_a are the transfer numbers of cation and anion, respectively, Δa and Δk are the weight losses of anolyte and catholyte, respectively, A is the electrochemical equivalent of the solid solution, B is the weight of Cu separated in a coulometer, and 1.19 is the electrochemical Cu equivalent. According to Table 2, t_k was < 0.01, t_a was ≤ 0.14, and the ionic conductivity was only $\sim$0.1 of the total value. Metal deposited on the cathode can be dissolved in the catholyte or increase the catholyte by dentrite formation. In

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this case, the transfer of ions is expected to decrease with the time of electrolysis. This fact and the voltage drop in the cell after the beginning of electrolysis supported the foregoing assumption. No changes were observed with the anolyte. Since $t_k + t_a = 1$ and $t_k \approx 0$, $t_a \approx 1$. The solid solutions of ZrO_2 and CaO, which are almost perfect anion conductors at 1000°C, can be used as electrolytes for heating elements at high temperatures. There are 3 figures, 2 tables, and 12 references: 7 Soviet and 5 non-Soviet. The two references to English-language publications read as follows: K. Kuikkola, C. Wagner, J. Electrochem. Soc., 104, 379, 1957; P. Duwez, F. Odell, F. H. Brown. J. Amer. Cer. Soc., 35, 107, 1952.

Table 2. Transfer numbers in the system ZrO_2 - CaO at 1000°C.
Legend: (1) composition, (2) total.

(1) Состав	$t_к$ (2) (суммарное)	$t_а$
$0,9ZrO_2 \cdot 0,1CaO$	0,001—0,009	0,02—0,06
$0,8ZrO_2 \cdot 0,2CaO$	0,001—0,01	0,03—0,04
$0,6ZrO_2 \cdot 0,4CaO$	0,001—0,004	0,08—0,14

Table 2

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31676
S/631/60/000/001/014/014
B110/B102

AUTHORS: Volchenkova, Z. S., Pal'guyev, S. F.

TITLE: Electrical conductivity of solid oxides. III. The system ThO_2 - CaO

SOURCE: Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov, no. 1, 1960, 127 - 130

TEXT: The present paper deals with the temperature dependence of electrical conductivity of the system ThO_2 - CaO. Pure ThO_2 and CaO were ground in an agate mortar and pressed to 1.0·1.0·0.2-0.4 cm tablets at $\sim$4000 kg/cm^2. The tablets were sintered at 1550 $\pm$ 20°C for 1 hr. The linear shrinkage, ceramic properties, and color were determined. The measuring method was described by the authors (Ref. 1: Trudy In-ta khimii UFAN SSSR, vyp. 2, 183, 1958). Pt electrodes were fixed to the polished tablet faces at $\leq$ 1100°C. Measurements were made at every 10° between 500 and 1100°C. The structure was studied by X-ray analysis. The conductivity increases with temperature according to $\varkappa = A \exp(-\Delta E/2kT)$. In the coordinates $\log \varkappa = f(1/T)$, the temperature is linearly dependent on the electrical

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Electrical conductivity of solid...

conductivity with a break at 700 - 800°C. Small additions of CaO to ThO_2 cause a sharp increase in conductivity (5% CaO increases it by more than 10 times at 1100°C and by more than 100 times at 500°C). Like in the system ZrO_2 - CaO, this increase is due to the increasing number of oxygen vacancies in the lattice of the solid solution. The slight decrease in conductivity caused by ≤ 40 mole% CaO is attributed to the vacancy interaction which hinder the migration of oxygen ions. Owing to the low sintering temperature ($1550 \pm 20°$) solid solutions of the ThO_2 - CaO system could not be detected, not even by X-ray structural analysis. In general, the sintering temperature should be 2/3 ($\sim 2000°C$) that of the melting temperature of ThO_2 (3300°C). Thus, the solution probably exists in the form of microscopical grains not detectable by X-ray structural analysis. The variation in activation energy with varying temperature also supports this assumption. At 500 - 750°C, a strong electrical resistance occurs between the microscopical grains of the solid solution, presumably intensified by the effect of free oxides. At 0 - 35 mole% CaO, $\Delta E_2 > \Delta E_1$. Above 750 - 800°C, ionic conductivity increases rapidly. In the range of

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Electrical conductivity of solid...

the conductivity maximum, with 5 - 40 mole% CaO, the samples can easily be sintered, are of great mechanical strength, low porosity, and have no cracks. An increase in conductivity with increasing CaO content ($\leq$ 5-10 mole%) is accompanied by increased linear shrinkage. The conductivity minimum caused by interaction of the components lies at 50 mole% CaO. Then, the conductivity increases and remains constant between 55 and 75 mole% CaO. These samples have good ceramic properties and a weak color. The rapid decrease in conductivity at~100 mole% CaO (white samples with poor ceramic properties) is obviously caused by large amounts of non-reacting CaO and ThO_2. The change in the conductivity activation energy corresponds exactly to the change of the conduction isotherms. There are 2 figures and 9 references: 7 Soviet and 2 non-Soviet.

X

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L 29985-65 EWG(j)/EWT(m)/EP F(c)/EWG(m)/EPR/T/EWP(t)/EWP(b) Pr-4/Ps-4 IJP(c)
RWH/JD/JG

ACCESSION NR: AT4048678 S/2631/64/000/005/0133/0144

AUTHOR: Volchenkova, Z. S.; Pal'guyev, S. F.

TITLE: The electrical conductivity of solid oxides. IX. Mixtures of hafnium oxide with the oxides of beryllium, magnesium, calcium, strontium and barrum

SOURCE: AN SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy, no. 5, 1964. Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov (Electrochemistyr of fused salt and solid electrolytes), 133-144

TOPIC TAGS: oxide conductivity, solid solution, hafnium oxide, beryllium oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, ionic conductivity, electron conductivity

ABSTRACT: Based on the method of electromotive force in a cell with different partial pressures of oxygen around the electrodes the authors studied the nature of the conductivity of several samples of the solid oxide systems HfO_2-BeO, HfO_2-MgO, HfO_2-CaO, HfO_2-SrO and HfO_2BaO in a wide range of compositions and temperatures. They showed that the conductivity is considerably greater in systems where solid solutions of the substitution-deduction type (HfO_2-MgO, HfO_2-CaO) form than in

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L 29985-65

ACCESSION NR: AT4048678

those systems where there is no formation of solid solutions (HfO_2-BeO, HfO_2-SrO, HfO_2-BaO). Measurements of the linear shrinkage of the sample during caking and of certain characteristics of the given oxide systems were also made, and it was shown that the formation of chemical compounds ($CaHfO_3$, $SrHfO_3$, and $BaHfO_3$) is accompanied by a minimum linear shrinkage in conductivity. At high temperatures, the solid solutions (HfO_2-MgO, HfO_2-CaO) are almost purely ionic conductors, while the conductivity of the samples of the HfO_2-SrO and HfO_2-BaO systems is chiefly electron in nature. It increases as the partial oxygen pressure in the gas phase increases, i.e., it becomes hole-type. Moreover, this relationship is somewhat stronger in a system containing BaO than in a system with SrO. In the HfO_2-BeO system, neither a solid solution nor a chemical compound is formed, and the interaction of the components is not reflected in the magnitude and nature of the conductivity. Orig. art. has: 10 figures, 9 tables and 1 formula.

ASSOCIATION: Institut elektrokhimii, Ural'skiy filial AN SSSR (Electrochemical institute, Ural'sk branch, AN SSSR)

SUBMITTED: 00 ENCL: 00 SUB CODE: IC, EM

NO REF SOV: 007 OTHER: 002

Card 2/2

PAL'GUYEV, S.F.; VOLCHENKOVA, Z.S. (Sverdlovsk)

Electric conductivity and transference numbers of the system CeO_2 - ZrO_2. Zhur. fiz. khim. 34 no.2:452-455 F '60. (MIRA 14:7)

1. Ural'skiy institut elektrokhimii.
(Cerium oxide) (Zirconium oxide)

84832

24.7700 1143, 1138, 1395

S/020/60/134/005/020/023
B004/B064

AUTHORS: Pal'guyev, S. F., Karpachev, S. V., Neuymin, A. D., and Volchenkova, Z. S.

TITLE: Transition From Electron to Ion Conductivity as a Function of the Composition of Solid Solutions of Oxides

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 5, pp. 1138-1141

TEXT: The authors wanted to study the influence of calcium oxide upon the electrical conductivity of solid solutions of cerium and zirconium oxides. Since the solid solution $0.75CeO_2 \cdot 0.25ZrO_2$ has the highest conductivity (Ref. 1), it was used as initial substance. CaO was added in varying amounts; addition of CaO of up to 40 mole% resulted in the formation of solid solutions. The preparation of the samples was already described in Ref. 1. The relative electron and ion conductivities were determined by the solid electrolyte emf method at temperatures ranging from 500° to 1000°C, and herefrom the activation energy was computed. It was found that ion conductivity increases with an increase in tempera-

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Transition From Electron to Ion Conductivity as a Function of the Composition of Solid Solutions of Oxides

S/020/60/134/005/020/023
B004/B064

ture, reaching a maximum at 750°C. Only electron conductivity is found in the system CeO_2 - ZrO_2; the addition of CaO diminishes the total conductivity with a minimum at approximately 8 mole% CaO; the maximum is reached at 40 mole% CaO, when the conductivity is nearly 100% ionic and approximately equal to the electron conductivity of the CeO_2 - ZrO_2 system. The experiments were carried out with two electrolytic chains. a) $(Pt)O_{2\,p_1}$ | solid electrolyte | $O_{2\,p_2}(Pt)$. The cell of this chain is schematically shown in Fig. 1. The sample placed in a quartz tube between platinum electrodes was at both ends in contact with oxygen of different pressures (p_1 = 1.0, p_2 = 0.2 atm). b) Me', Me'(O) | solid electrolyte | | Me"(O), Me". This cell operated in vacuum without addition of gaseous oxygen. The partial pressure of O was determined from the dissociation pressure of the oxides (mixtures of Fe and FeO, Cu and Cu_2O), and ranged from 10^{-7} to 10^{-25} atm. The electron and ion conductivities were determined from $E = \left[1 - (\bar{t}_e + \bar{t}_o)\right] E_c$. E is the measured emf; $\bar{t}_e$, $\bar{t}_o$ the average

Transition From Electron to Ion Conductivity as a Function of the Composition of Solid Solutions of Oxides

S/020/60/134/005/020/023
B004/B064

transference numbers of electrons and holes, respectively. E_0 the thermodynamic value of the emf: $E_0 = (RT/4F) \cdot \ln(p_2/p_1)$. Table 1 lists the experimental data. Fig. 2 shows conductivity and ΔE at 1000°C as a function of the CaO content. With rising CaO content in the system CeO_2 - ZrO_2 - CaO, the authors found a steady transition from electron to ion conductivity. This effect was not observed in the systems CeO_2 - CaO and ZrO_2 - CaO. The authors give the following explanation: As a result of partial reduction of Ce^{4+} to Ce^{3+}, first an intense electron conductivity occurs in the system CeO_2 - ZrO_2. Increasing addition of CaO inhibits this reduction more and more, and the ion conductivity caused by oxygen ions takes the place of electron conductivity. A decrease of conductivity in samples containing over 40 mole% CaO is attributed to the accumulation of free CaO not converted into a solid solution. There are 1 figure, 2 tables, and 9 references: 5 Soviet, 3 US, and 1 German.

Card 3/4

84832

Transition From Electron to Ion Conductivity as a Function of the Composition of Solid Solutions of Oxides

S/020/60/134/005/020/023
B004/B064

ASSOCIATION: Institut elektrokhimii Ural'skogo filiala Akademii nauk SSSR
(Institute of Electrochemistry of the Ural Branch of the Academy of Sciences USSR)

PRESENTED: June 6, 1960, by A. N. Frumkin, Academician

SUBMITTED: June 6, 1960

Card 4/4

34365

S/078/62/007/003/011/019
B110/B138

15.2230

AUTHORS: Pal'guyev, S. F., Volchenkova, Z. S.

TITLE: Use of the electrical conductivity method to the study of the nature of interaction among the components of oxide mixtures

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 3, 1962, 615 - 617

TEXT: Using own earlier findings (Zh. fiz. khimii, 34, 452 (1960); Tr. In-ta elektrokhimii Ural'skogo filiala AN SSSR, vyp. 1, 119 (1960); ibid. vyp. 2; Dokl. AN SSSR, 134, 1138 (1960)) the authors state that the conductivity method can be used to detect the formation of chemical compounds. Thus, for $CaZrO_2$, $SrZrO_3$, $BaZrO_3$, $SrCeO_3$, and $BaCeO_3$, low minima were found on the conductivity isotherms and on the curves of linear shrinkage on sintering. It is suggest that the compound $2SrO \cdot ZrO_2$ exists in the system ZrO_2-SrO, as a linear expansion of about 11% occurs on sintering. Thermal and X-ray phase analyses of $2SrO \cdot ZrO_2$ samples would be useful. In many oxide systems the dioxides form cubic solid solutions of

Card 1/3

Use of the electrical...

the second kind with imperfect crystal lattice (vacancies in the anion sublattice). The number of vacancies grows with dioxide concentration. Conductivity grows with the number of vacancies until they react with one another. The conductivity peaks of ZrO_2-MgO; ZrO_2-CaO; CeO_2-MgO; CeO_2-CaO; CeO_2-SrO; CeO_2-ZrO_2-CaO with 15 - 25 moles% MeO are dependent on this. In the ZrO_2-MgO system besides the cubic, a monoclinic solid solution (0.4 moles% MgO) was found by electrical conductivity. In ZrO_2-CaO, a solid solution of monoclinic ZrO_2 was found with low CaO concentration. In ZrO_2-CeO_2, the electrical conductivity minimum is determined by the semiconductor properties of the oxides in the solid solution. In CeO_2-ZrO_2-CaO, with 8 moles% CaO, the minimum is related to the transition from electron to ionic conductivity. The capacity for chemical interaction, reduction, and the type of phase are revealed as extreme values on the electrical conductivity - composition isotherms. Their interpretation, together with that of sintering shrinkage, can be used to reveal the very faintest physical properties of the oxides examined.

V. N. Yeremenko (Zh. neorgan. khimii, 1, 2118 (1956)) is mentioned. There are 1 figure and 15 references: 12 Soviet and 3 non-Soviet. The two references to English-language publications read as follows: W. B. Blumenthal. The Chemical Behavior of Zirconium. D. van Nostrand Company Inc. Princeton, New Jersey, Toronto, New York, London, 1958, p. 167; Uei, Nakadzava, Uetsuki. J. Ceram. Assoc. Japan, 64, 139 (1956).

ASSOCIATION: Ural'skiy filial AN SSSR Institut elektrokhimii (Ural Branch AS USSR, Institute of Electrochemistry)

SUBMITTED: March 20, 1961

Card 3/3

L 13267-65 EWG(j)/EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b) Pr-4/Ps-4 ASD(m)-3
JD/JG/JXT(CZ)

ACCESSION NR: AT4048681 S/2631/64/000/005/0163/0166

AUTHOR: Strekalovskiy, V. N.; Burov, G. V.; Samarina, V. A.; Volchenkova, Z. S.

TITLE: Structural components of the hafnium oxide-calcium oxide system

SOURCE: AN SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy*, no. 5, 1964. Elektrokhimiya rasplavlenny*kh solevy*kh i tverdy*kh elektrolitov (Electrochemistry of fused salt and solid electrolytes), 163-166

TOPIC TAGS: hafnium oxide, calcium oxide, oxide ceramic, hafnium oxide calcium oxide system, calcium hafnate, phase analysis

ABSTRACT: Experimental data on the phase composition of products of the high-temperature reaction between HfO_2 and CaO have been obtained to supplement the literature data. Compacted mixtures of HfO_2 with 0—85 mol.% CaO were sintered under various conditions, and the products were analyzed by the x-ray diffraction method in an RKD chamber

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L 13267-65

ACCESSION NR: AT4048681

and by chemical methods, including separate analysis of HCl soluble and insoluble fractions. Analysis of products of the sintering of equimolar mixtures successively at 1200 and 1500C produced evidence of the existence of an unknown X-phase, differing from the previously detected common calcium hafnate in chemical composition and in the parameters of the unit cell (rhombic). The new X-phase is believed to be a modification of calcium hafnate. Another new hexagonal Y-phase was identified in the sintered mixture of HfO_2 with 85 mol% CaO. The formula Ca_7HfO_9 was tentatively assigned to the Y-phase. The known solid solution with a fluorite structure was detected in samples containing 5—25 mol% CaO; the lattice constant of the solid solution was found to fluctuate in the 5.095—5.105 kX range, without direct correlation with CaO content. Orig. art. has: 2 tables and 1 figure.

ASSOCIATION: none

SUBMITTED:: 00 ENCL: 00 SUB CODE: IC, GC

NO REF SOV: 004 OTHER: 001 ATD PRESS: 3128

Card 2/2

L 38507-65 EPF(c)/EPF(n)-2/EPR/EWG(j)/EWA(c)/EWT(l)/EWT(m)/EWG(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t) Pr-4/Ps-4/Pu-4 IJP(c) WW/JD/JG/GS

ACCESSION NR: AT5007729 S/0000/63/000/000/0118/0134

AUTHOR: Pal'guyev, S. F.; Neuymin, A. D.; Volchenkova, Z. S.; Yushina, L. D.

TITLE: Electrical conductivity of highly refractory oxides at high temperatures

SOURCE: AN SSSR. Institut khimii silikatov. Silikaty i okisly v khimii vysokikh temperatur (Silicates and oxides in high-temperature chemistry). Moscow, 1963, 118-134

TOPIC TAGS: metal oxide, refractory oxide, oxide conductivity, high temperature conductivity, rare earth oxide

ABSTRACT: The electrical conductivity of pure oxides and their mixtures was investigated. The pure oxides were (a) the dioxides of zirconium, thorium, and cerium; (b) the oxides of beryllium, magnesium, calcium, and strontium; and (c) the oxides of yttrium, lanthanum, and neodymium. In all these groups the

dioxide (ThO_2-BeO, ThO_2-MgO, ThO_2-CaO, ThO_2-SrO, ThO_2-BaO), (c) systems based on

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L 36507-65

ACCESSION NR: AT5007729

cerium dioxide (CeO_2-BeO, CeO_2-MgO, CeO_2-CaO, CeO_2-SrO, CeO_2-BaO), and (d) the systems (CeO_2-ZrO_2) and (0.75CeO_2-0.25ZrO_2)-CaO. In all these mixtures, the [illegible] terms of the electrical conductivity at 1000° were plotted. The experimental results [illegible] sensitive to many of their other properties, such as the tendency to re-

be reduced. The conductivity also depends on the nature of the phases present.
Orig. art. has: 7 figures and 1 formula.

ASSOCIATION: None

SUBMITTED: 0000063 ENCL: 00 SUB CODE: MT, IC, EM

NO REF SOV: 023 OTHER: 018

Card 2/2 ME

VOLOKHONKOVA, Z.S.; STREKALOVSKIY, V.N.; PALUGUYEV, S.F.

Structure, conductance, and the type of conductance in the ternary system $(0,75ZrO_2 - 0,25Y_2O_3) - CaO$. Izv.AN SSSR.Neorg.mat. 1 no.7: 1171-1176 Jl '65. (MIRA 18:9)

1. Institut elektrokhimii Ural'skogo filiala AN SSSR.

L 12056-66 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/WW/JG
ACC NR: AP6001304 SOURCE CODE: UR/0363/65/001/008/1372/1375

AUTHOR: Strekalovskiy, V. N.; Volchenkova, Z. S.; Samarina, V. A.

ORG: Institute of Electrochemistry, Ural Branch, Academy of Sciences SSSR (Institut elektrokhimii Ural'skogo filiala Akademii nauk SSSR)

TITLE: Contribution to the study of phase components in the ZrO_2-$PrO_{1.83}$ system

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 8, 1965, 1372-1375

TOPIC TAGS: zirconium compound, praseodymium compound

ABSTRACT: The structural components of the ZrO_2-$PrO_{1.83}$ system were studied in samples obtained by sintering powder mixtures of the two oxides. The phase composition of the products was studied by x-ray diffraction and chemical analyses. In all samples, a phase with a fluorite structure was present. In mixtures of equimolar composition, another phase designated by X was also present. The reaction products behave differently toward hydrochloric acid: the solubility is low in the region adjacent to the original ZrO_2, and high (almost complete) as $PrO_{1.83}$ is approached. The boundary of zero solubility is the equimolar composition. The chemical compound X was insoluble in HCl. In comparing the x-ray and chemical analyses, the authors found it difficult to arrive at a general interpretation of the data: on the one hand,

Card 1/2 UDC: 546.831'656

L 12056-66
ACC NR: AP6001304

broad regions of solid solutions with a fluorite-type structure were observed, the nature of the formation of which varies; on the other hand, the character of the distribution of the reacting oxides is apparently related to the presence of a large number of phases in the reaction products. Orig. art. has: 2 figures and 3 tables.

SUB CODE: 07, 11 / SUBM DATE: 13Jul64 / ORIG REF: 004 / OTH REF: 004

oxide 27

Card 2/2

L 2288-66 EWP(e)/EWT(m)/EWP(w)/EPF(c)/EPF(n)-2/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD/WW/JG

ACCESSION NR: AP5022271 UR/0363/65/001/007/1171/1176
541.123.3

AUTHOR: Volchenkova, Z. S.; Strekalovskiy, V. N.; Pal'guyev, S. F.

TITLE: Structure, electric conductivity, and nature of conductance in the ternary system ($0.75CeO_2$ - $0.25ZrO_2$) - CaO

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 7, 1965, 1171-1176

TOPIC TAGS: electric conductivity, cerium compound, zirconium compound, calcium oxide

ABSTRACT: The structure and electric conductivity were investigated in the system ($0.75CeO_2$ - $0.25ZrO_2$) - CaO over a wide range of compositions (from 0 to 100 mole % CaO) and temperatures (500-1000C). The samples were prepared by sintering powder mixtures for 2 hr at 1350C. X-ray phase analysis showed the presence of two phases: solid solution of CaO in ($0.75CeO_2$ - $0.25ZrO_2$) with a fluorite-type structure, and CaO (at high contents of the latter). Electric conductivity isotherms at 500, 600, 700, 800, 900, and 1000C were plotted. The change in the temperature coefficients of conductivity and the percent shrinkage

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L 2288-66
ACCESSION NR: AP5022271

of the samples during sintering as a function of composition were determined. It is found that as the amount of calcium oxide added increases, the unit cell constant of the solid solution changes. This phenomenon is correlated with the data on the total electrical conductivity and data obtained earlier from a determination of the transference numbers of ions and electrons. Orig. art. has: 6 figures and 2 tables.

ASSOCIATION: Institut elektrokhimii Ural'skogo filiala Akademii nauk SSSR (Institute of Electrochemistry, Ural Branch, Academy of Sciences SSSR)

SUBMITTED: 10Apr65 ENCL: 00 SUB CODE: IC, GC

NO REF SOV: 009 OTHER: 005

Card 2/2 DP

L 16608-65 ESD(gs)/ASD(a)-5/AS(mp)-2/AFETR
ACCESSION NR: AT4048677 S/2631/64/000/005/0123/0131

AUTHOR: Chebotin, V. N.; Volchenkova, Z. S.; Pal'guyev, S. F. B+1

TITLE: Electronic conductivity of ionic crystals in equilibrium with the gas phase. III. Oxidation semiconductor with admixed acceptors

SOURCE: AN SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy*, no. 5, 1964. Elektrokhimiya rasplavlenny*kh solevy*kh i tverdy*kh elektrolitov (Electrochemistry of fused salt and solid electrolytes), 123-131

TOPIC TAGS: hafnium dioxide, ionic crystal conductivity, semiconductor impurity, oxygen pressure, solid electrolyte, oxidation semiconductor

ABSTRACT: This study was prompted by the scarcity of information on hafnium dioxide conductivity. It is a continuation of two former communications by the same authors where they worked out the system of equations which is applied here to an ionic crystal having, in addition to inherent defects, acceptors in the form of impurities. This theory is used to explain the abnormal dependence of the p-conductivity of hafnium dioxide on oxygen pressure. The theory is explained in 19 equations and the experimental procedures are described: hafnium dioxide with ZrO_2(0.75%), Si(0.1%), Ti(0.1%), Mg(<0.1%); Ni(<0.001%) and Bi(0.003%) admixtures was calcined, pressed, ground, pressed and

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L 16608-65
ACCESSION NR: AT4048677

calcined again (1550C for 2 hrs.); tablets were polished and provided with Pt electrodes. In various boundary cases it has been found that the number of free electron holes depends on the temperature and on the pressure of the nonmetallic gas phase component with which the crystal is in equilibrium. Only considerable admixtures distort the behavior of the crystal, otherwise it acts as a normal oxidation semiconductor. The electrical conductivity and average transfers of HfO_2 in different media and temperatures (700-1000C) have been measured. Ionic conductivity is affected only slightly by increased O_2 pressure. Electronic conductivity depends on the oxidation of the crystal at high O_2 pressures and is proportional to $p^{1/4}$. In a strongly reducing environment, HfO_2 loses electron holes, thus compensating for the excessive negative charge with O_2 vacancies and resulting in an electronic conductivity of practically zero. Orig. art. has: 2 figures, 30 formulas and 1 table.

ASSOCIATION: Institut elektrokhimii, Ural'skiy filial AN SSSR (Institute of Electrochemistry, Urals Branch, AN SSSR)

SUBMITTED: 00 ENCL: 00 SUB CODE: SS, EM

NO REF SOV: 006 OTHER: 004

Card 2/2

VOLCHENKOVA, Z.S.; PAL'GUYEV, S.F.

Electric conductivity of solid oxides. Part 9: Systems HfO_2 - BeO, HfO_2 - MgO, HfO_2 - CaO, HfO_2 - SrO, and HfO_2 - BaO. Trudy Inst. elektrokhim. UFAN SSSR no.5:133-144 '64. (MIRA 18:2)

STRUKATOVSKIY, V.I.; [illegible], G.V.; [illegible], T.A.; [illegible]

Structural constituents in the system HfO_2 - [illegible]. Trudy Inst. elektrokhim. UFAN SSSR no.5:163-166 '64.

(MIRA 18:3)

ACCESSION NR: AT4008734 S/2631/63/000/004/0067/0081

AUTHOR: Volchenkova, Z. S.; Pal'guyev, S. F.

TITLE: Electrical conductivity in solid oxides. 7. Systems ThO_2-BeO, ThO_2-MgO, ThO_2-SrO, and ThO_2-BaO

SOURCE: AN SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy*, no. 4, 1963. Elektrokhimiya rasplavlenny*kh solevy*kh i tverdy*kh elektrolitov, 67-81

TOPIC TAGS: refractory oxide, electric ceramic, mixed oxide, solid oxide, thoria, thorium oxides, beryllia, beryllium oxide, alkaline earth oxides, magnesia, strontium oxide, barium oxide, ThO sub 2-BeO, system, ThO sub 2-SrO system, ThO sub 2-MgO system, ThO sub 2-BaO system, ceramic oxide property, metal oxide system

ABSTRACT: The electrical conductivity at 300-1000C was studied in varying quantitative combinations (from pure ThO_2 to pure MeO) of the above systems. The procedure was the same as described in the previous papers on the subject (Trudy* Instituta Khimii UFAN, No. 2, 1958, no. 1, 1960, no. 2, 1961, and Zhurnal Fizicheskoiy Khimii, 1960, 34, 452). The systems ThO_2-BeO and ThO_2-MgO give some indications of slight solubility of BeO and MgO in ThO_2 and the formation of the chemical compound $MgO \cdot ThO_2$ may take place in the system ThO_2-MgO.
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ACCESSION NR: AT4008734

MeO-additions up to 15 mol % enhance the conductivity by approximately one order in the systems ThO_2-SrO and ThO_2-BaO, intensify the color of samples and cause their contraction, which suggests the possible formation of solid solutions. It was shown that the formation of $BaThO_3$ produces a deep linear contraction minimum during the thermal agglomeration of samples and also produces a conductivity minimum. The considerable diminution of contraction and the course of the specific conductivity isotherms suggest the existence of the compounds $BaTh_3O_7$, $SrThO_3$, and Sr_2ThO_4 in the combinations 0.25 BaO·0.75 ThO_2, 0.5 SrO·0.5 ThO_2, and 0.7 SrO·0.3 ThO_2. Orig. art. has: 10 graphs and 4 tables.

ASSOCIATION: Institut elektrokhimii, Ural'skiy filial AN SSSR (Electrochemical Institute, Urals Branch, AN SSSR)

SUBMITTED: 00 DATE ACQ: 25Jan64 ENCL: 00

SUB CODE: MT NO REF SOV: 011 OTHER: 012

Card 2/2

STREKALOVSKIY, V.N.; BUROV, G.V.; SAMARINA, V.A.; PAL'GUYEV, S.F.; VOLCHENKOVA, Z.S.

Interaction between CeO_2 and MgO in the solid state. Trudy Inst. elektrokhim. UFAN SSSR no.3:171-177 '62. (MIRA 16:6)

(Cerium oxides) (Magnesium oxide)
(Solutions, Solid)

STREKALOVSKIY, V.N.; BUROV, G.V.; PAL'GUYEV, S.F.; VOLCHENKOVA, Z.S.; SAMARINA, V.A.

Relation between electrical and structural properties in the CeO_2 - SrO system. Trudy Inst. elektrokhim. UFAN SSSR no.3: 165-169 '62. (MIRA 16:6)

(Cerium oxides) (Strontium oxide)
(Solutions, Solid—Electric properties)

VOLCHENKOVA, Z.S.; PAL'GUYEV, S.F.

Electric conductance of solid oxides. Part 3: ThO_2 - CaO system. Trudy Inst.elektrokhim.UFAN SSSR no.1:127-130 '60. (MIRA 15:2)
(Metallic oxides--Electric properties)

VOLCHENKOVA, Z.S.; PAL'GUYEV, S.F.

Electric conductance of solid oxide systems. Part 2:
ZrO_2 - CaO system. Electric conductance and transfer numbers.
Trudy Inst.elektrokhim.UFAN SSSR no.1:119-126 '60. (MIRA 15:2)
(Metallic oxides--Electric properties)

40827

S/631/61/000/002/009/013
1003/1203

24.7700

AUTHORS: Pal'guyev, S. F., and Volchenkova, Z. S.

TITLE: Electric conductivity of solid oxides. IV. The CeO_2-BeO, CeO_2-MgO, CeO_2-CaO CeO_2-SrO, and CeO_2-BaO systems

SOURCE: Akademiya nauk SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy, no. 2, 1961. Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov. 157-172

TEXT: The electric conductivity of pure solid oxides and of their solid solutions has not been of these substances sufficiently studied, despite the wide industrial application. The plot of log $1/T$ is a stright line with inflections at characteristic temperatures for every system. Measurements of the electric conductivity of BeO, MgO, CaO, and SrO, between 500 and 1300°C, shows that at elevated temperatures the conductivity rises with temperature according to the relation $\chi = A \exp(sE/2kT)$. The activation energy of the current carriers decreases steadilly with increase in the ionic radius of the cation, i.e., with decrease of the lattice energy of the oxide. The electric conductivity of the CeO_2-BeO, CeO_2-MgO, CeO_2-SrO, and CeO_2-BaO systems, measured over a wide range of temperature (300–1000°C) and chemical composition, is little depen dent on the value of the ionic radius of the bivalent metal. This is probably due to the different nature of the current carriers in these two cases. The variation of linear shrinkage of the samples on sintering as well as the variation of the electric conductivity of samples with different chemical compositions are probably related to their crystal structure. There are 12 figures, and 6 tables.

Card 1/1

40828

S/631/61/000/002/010/013
I003/I203

24.7700

AUTHORS: Volchenkova, Z. S., and Pal'guyev, S. F.

TITLE: Electric conductivity of solid oxides. V. The ZrO_2–BeO, ZrO_2–CaO, ZrO_2–MgO, ZrO_2–SrO, and ZrO_2–BaO systems

SOURCE: Akademiya nauk SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy, no. 2, 1961, Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov. 173–183

TEXT: The electric conductivity of the above systems was investigated for a wide range of temperature and chemical composition. The conductivity is considerably higher for systems forming solid solutions (ZrO_2–MgO and ZrO_2–Ca). The temperature dependence of the electric conductivity is given by the equation: $\chi = Ae - \Delta E/kT$. The plot of log χ is $1/T$ is a straight line with one or more inflections. The linear shrinkage of samples on sintering was measured, and their applicability as ceramics was investigated. The formation of chemical compounds (calcium, strontium, and barium monozirconates) results in a minimum linear shrinkage and electric conductivity. On the basis of these two criteria a chemical compound with the formula $2SrO.ZrO_2$ is believed to be formed in a mixture containing 65 mole % SrO and 35 mole % ZrO_2. There are 10 figures and 4 tables

Card 1/1

PAL'GUYEV, S.F.; VOLCHENKOVA, Z.S.

Electric conductivity method used in the study of the nature of interaction of components of oxide systems. Zhur.neorg.khim. 7 no.3:615-617 Mr '62. (MIRA 15:3)

1. Ural'skiy filial AN SSSR, Institut elektrokhimii.
(Metallic oxides--Electric properties)

EXCERPTA MEDICA Sec 9 Vol 13/11 Surgery Nov 59

6348. (1401) THE SURGICAL TREATMENT OF TUBERCULOUS SPONDYLITIS IN A REGIONAL BONE TB SANATORIUM (Russian text) - Volchenok K. I. - VESTN. KHIR. 1959, 82/3 (99-106) Tables 1 Illus. 3

During 2 yr. (1957-1958) 39 patients with tuberculous spondylitis underwent 61 operations at the sanatorium 'Pechory' for bone tb. Two types of surgical interventions were applied: (1) radical operation to remove the central focus of the spine (26 cases) and (2) non-radical surgery to excise the soft tissue sites of suppuration and necrosis (36 cases). The former comprises isolated necrectomies of foci in the body of vertebrae, as also necrectomy associated with abscessotomy and fistulotomy. Operative peculiarities, complications and results of thoracic, lumbar and lumbosacral region interventions are discussed. It is contended that in a regional sanatorium for bone tb an active surgical treatment of various forms of tuberculous spondylitis differently located is possible and results in a positive outcome.

(IX, 16, 19*)

VOLCHENOK, K.I.

Tuberculous spondylitis complicated by bronchoesophageal fistulae. Vest. khir. 93 no.8:95-98 Ag '64. (MIRA 18:7)

1. Iz Narvskogo kostnotuberkuleznogo sanatoriya (glavnyy vrach A.M.Malevskiy).

VOLCHENOK, K.I.

Surgical treatment of tuberculous spondylitis in a sanatorium for bone tuberculosis [with summary in English]. Vest.khir. 82 no.3: 99-106 Mr '59. (MIRA 12:4)

1. Iz Pskovskogo oblastnogo kostnotuberkuleznogo sanatoriya "Pechory" g. Pechory (glavnyy vrach - N.Ya. Korableva). Adres avtora: Pechory, Pskovskoy obl., kostnotuberkuleznyy sanatoriy.
(TUBERCULOSIS, SPINAL, surg.
in bone tuberc. sanatorium (Rus))

BRAGINSKIY, G.I.; VOLCHENOK, M.P.

Decreasing the shrinkage of the base in motion picture film. Trudy LIKI no.3:235-239 '55. (MLRA 9:8)

1. Kafedra tekhnologii proizvodstva kinofotomaterialov.
(Cinematography--Films)

NIKITIN, V.N.; VOL'KENSHTEYN, M.V.; VOLCHEK, B.Z.

Investigation of the dilation of polymers in polarized infrared light. Zhur. tekh.fiz.25 no.14:2486-2491 D '55. (MLRA 9:2)
(Polymers and polymerization) (Spectrum, Infrared)

The stretching of polymers in polarized infrared radiation. V. N. Nikitin, M. V. Vol'kenshtein, and B. Z. Volchek. *Zhur. Tekh. Fiz.* 25, 2488–91(1955).—Polyethylene films were stretched at room temp. Polyvinyl acetate films obtained from acetone solns., cast on Hg, were stretched at 80°; polyvinyl acetate samples had mol. wts. of 1.1×10^6, 1.6×10^5, and 2.6×10^4. Absorption coeffs. of infrared bands were obtained at different positions of the polarizer (3 Se films of 5 μ thickness each), as a function of the extension of the film. Measurements made on bands 1308, 1380, and 1460 cm.$^{-1}$ of polyethylene show that the dichroism of band 1460 cm.$^{-1}$ increases to 1000% stretch and remains const. from then on. In polyvinyl acetate, the absorption measurements were made on bands 1740, 1440, 1370, 1250, 1050, and 950 cm.$^{-1}$ Dichroism is present in the sample of mol. wt. 1.1×10^6 and is absent in both other samples. The measurements are in agreement with the theory.

S. Paksver

LUR'YE, M.A.; KAMENETSKIY, [illegible]; VOLOCHENOK, M.Kh.

Economic efficiency of introducing new equipment in the manufacture of refractories. Ogneupory 28 no.10:433 '63. (MIRA 16:11)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.

VOLCHENOK, [illegible]

Regularized teaching of driving regulations. Avt. transp. 34 no.10:29 O '56. (MLRA 9:12)

1. Prepodavatel' Yeniseyskogo lesomekhanicheskogo uchilishcha. (Automobile drivers) (Automobiles--Laws and regulations)

L 9199-66 EWT(1)/FCS(k) /T/ETC(m)/EWA(1) IJP(c) WW/AT

ACC NR: AR6000104 SOURCE CODE: UR/0058/65/000/008/G006/G006

67
B

SOURCE: Ref. zh. Fizika, Abs. 8G43

AUTHORS: Kogen-Dalin, V. V.; Volchenskov, V. I.

ORG: none

TITLE: Theoretical investigation of the operation of an electrodynamic converter of the energy of a gas stream into electricity

CITED SOURCE: Tr. Mosk. energ. in-ta, vyp. 57, 1964, 187-209

TOPIC TAGS: kinetic energy conversion, electrodynamics, gas dynamics

TRANSLATION: An analysis is presented of the operating conditions of a most simple converter of the energy of a gas stream into electricity. A converter with a stream of charged particles whose velocity v remains constant in the working volume is considered. Formulas are derived for the voltage and power developed by the generator. The obtained expressions are analyzed and practical conclusions are drawn concerning the advantageous trends in the construction of electrodynamic-type converters.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000

Card 1/1

BULGARIA / Farm Animals. Domestic Fowls Q

Abs Jour: Ref Zhur-Biol., No 5, 1958, 21507

Author : Volchev Petr
Inst :
Title : The Effect of Different Feed Rations upon the Productivity of Hens (Vliyaniye razlichnykh rezhimov kormleniya kur na ikh produktivnost')

Orig Pub: Zhivotnov"dstvo i vet. delo, 1957, 11, No 3, 22-24

Abstract: An experiment was carried out on 4 groups of young hens of the Rhode Island breed. All groups were similar in weight and age. The first group was fed dry flour mixture once during the daytime, and then in the evening the feed was supplemented by 40 g. of the grain mixture per egg-laying hen; the second group received flour and grain mixture from automatic feeders; the third group was first fed a flour mixture

Card 1/2

BULGARIA / Farm Animals. Domestic Fowls Q

Abs Jour: Ref Zhur-Biol., No 5, 1958, 21507

Abstract: from automatic feeders, and then was given a mixture of protein feeds; the fourth group received a mixture of protein feeds and grain from automatic feeders. All hens were fed abundantly and received the same amount of carrots, mangel-wurzel, green grass, alfalfa flour, cod liver oil, charcoal, and sand. The best egg-productivity was shown by the fourth group - 134.35 eggs; the first group came next with 129.55 eggs; the second produced 108.5 eggs and the third one laid 95.78 eggs. The cost per weight unit of the eggs laid by the fourth group was the lowest and their death rate was also the lowest.

Card 2/2

VOLCHIKHIN, Valentin

Combines (Agricultural Machinery)

Without knowledge there is no creativeness! Mol. kolkh. 20, No. 4, 1953.

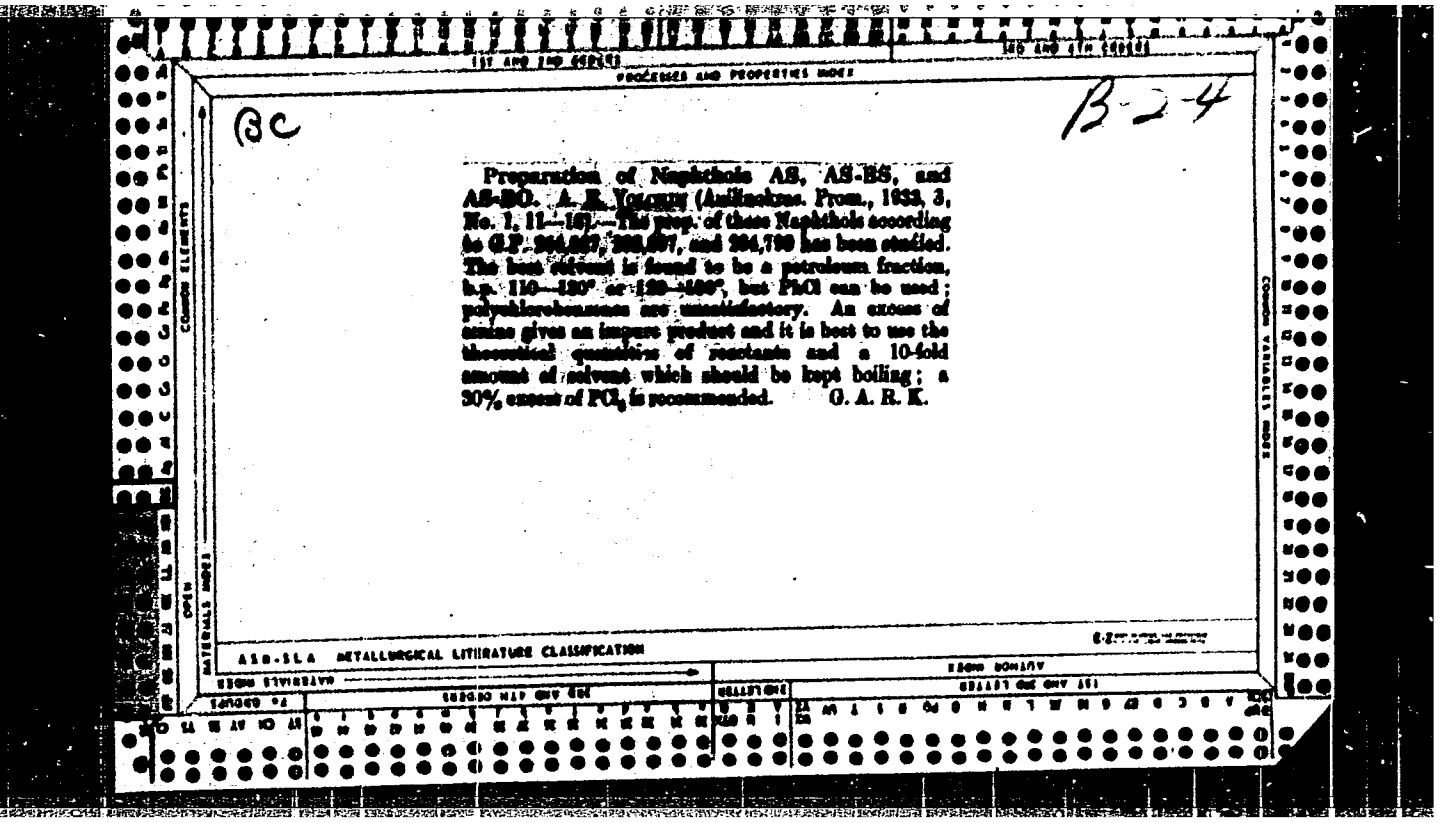
9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

VOLCHIKHIN, Valentin Georgiyevich.

Epp.
.R9416
1955

Za vysokiye urozhai (For a greater harvest) Izd. 2., ispr. i dop. Moskva, Profizdat, 1955.
86 p. diagr.

hhb



GC

B-2-4

Preparation of Naphthols AS, AS-BS, and AS-BO. A. R. Yagodin (Anilinokras. Prom., 1933, 3, No. 1, 11—16).—The prep. of these Naphthols according to G.P. 264,627, 268,627, and 284,799 has been studied. The best solvent is found to be a petroleum fraction, b.p. 110—130° or 120—160°, but PhCl can be used; polychlorobenzenes are unsatisfactory. An excess of amine gives an impure product and it is best to use the theoretical quantities of reactants and a 10-fold amount of solvent which should be kept boiling; a 30% excess of PCl_3 is recommended. G. A. R. K.

KISEL', N. (Tallinn); TARASOV, G. (g.Gubakha, Permskaya oblast'); VOLCHIN, V. (Priozerskiy rayon, Leningradskaya oblast')

Exchange of experience. Radio no.12:30 D '60. (MIRA 14:1)
(Radio) (Television)

VOLCHINSKAIA, N. I.

"Synthesis of hydrocarbons. Part 38. Synthesis of alkenes and alkanes with two quaternary carbon atoms." Levina, R. IA., Shusherina, N. P., Volchinskaia, N. I., Lur'e, M. IU. (p. 400)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1953, Volume 23, No.3.

VOLCHINSKAYA, N.I.; SENTYURIKHINA, L.N.; OPARINA, Ye.M.

Study of the thixotropic qualities of solid oils. Trudy VNII NP no.7:374-378 '58. (MIRA 12:10)
(Lubrication and lubricants)

VOLCHINSKAYA, N.I.

Chemical Abst.
Vol. 48
Apr. 10, 1954
Organic Chemistry

Synthesis of hydrocarbons. (XXVIII. Synthesis of alkenes and alkanes with two quaternary carbon atoms

M. Yu. Lur'e (Moscow State [illegible]

Zhur. Obshchei Khim. 23, 400–8 (1953); cf. C.A. 47, 12218d; 48, 2979h. Me_3CCl (19 g.) in 1 vol. Et_2O was slowly added to 18 g. Mg under Et_2O (Mg activated with 1.8 ml. $BrCH_2CH_2Br$), and the mixt. refluxed with stirring 7 hrs., cooled to −10°, treated over 0.5 hr. with 72 g. HBr adduct (I) of $Me_2C{:}CHCMe{:}CH_2$ in 1 vol. Et_2O, stirred 3 hrs. at −30° and 2 hrs. at room temp., left overnight, stirred with heating 8 hrs., and decomposed with ice-NH_4Cl; the org. layer yielded 17% *2,2,3,3,5-pentamethyl-4-hexene*, which, after purification over Na, b_{760} 170–70.2°, n_D^{20} 1.4470, d_4 0.7836; the higher-boiling material yielded 17% *2,4-dimethyl-1,3-pentadiene dimer*, b_{20} 217–13°. Hydrogenation of the diene over Ni-Al_2O_3 at 160–70° gave *2,2,3,3,5-pentamethylhexane*, b_{760} 172.8–3.5°, n_D^{20} 1.4302, d_{20} 0.7073. Similarly Me_3CMgCl with I gave 14% *2,2,3,5-tetramethyl-3-ethyl-4-heptene* (II), b_{760} 210.5–11.5°, n_D^{20} 1.4574, d_{20} 0.8012, and 55% *3,5-dimethyl-3-heptene*, b_{760} 130.5–1.0°, n_D^{20} 1.4222, d_4 0.7222. II was hydrogenated to *2,2,3,5-tetramethyl-3-ethylheptane*, b_{760} 214.5–15.5°, n_D^{20} 1.4440, d_{20} 0.7891. G. M. K.

VOLCHINSKAYA, N. I.

"Synthesis of hydrocarbons. XXXVIII. Synthesis of alkenes and alkanes with two quaternary carbon atoms. R. Ya. Levina, N. P. Shusherina, N. I. Volchinskaya, and M. Lur'e. *J. Gen. Chem. U.S.S.R.* 23, 2075-8 (1953) (Engl. translation).—See *C.A.* 48, 3885*h*. H. L. H.

KUTATELADZE, S.S.; LEONT'YEV, A.I.; RUBTSOV, N.A.; GOL'DSHTIK, M.A.; VOLCHKOV, E.P.; DAVYDOVA, M.V.; DRUZHININ, S.A.; KIRILLOVA, N.N.; MALENKOV, I.G.; MOSKVICHEVA, V.N.; MIRONOV, B.P.; MUKHIN, V.A.; MUKHINA, N.V.; REBROV, A.K.; FEDOROV, V.K.; KHABAKHPASHEVA, Ye.M.; SHTOKOLOV, L.S.; SHPAKOVSKAYA, L.I., red.

[Heat and mass transfer and friction in a turbulent boundary layer] Teplomassoobmen i trenie v turbulentnom pogranichnom sloe. Novosibirsk, Red.-izd. otdel Sibirskogo otd-niia AN SSSR, 1964. 206 p. (MIRA 18:1)

VOLCHKEVICH, L.I.; USOV, B.A.; LEBEDEV, A.S., inzh., retsenzent; YARKOV, A.M., inzh., retsenzent; MALOV, A.N., prof., red.

[Automatic feed mechanisms] Avtooperatory. Moskva, Mashinostroenie, 1965. 142 p. (MIRA 18:12)

VOLCHKEVICH, L.I.

Increasing the reliability of automatic lines composed of machine-tool units. Standartizatsiia 29 no.6:12-13 Je '65. (MIRA 18:12)

VOLCHKEVICH, L.I., kand. tekhn. nauk

Determining reliability requirements for mechanisms and machine tools in automatic lines. Vest. mashinostr. 45 no.4:13-19 Ap '65. (MIRA 18:5)

VOLCHKEVICH, L.I., inzh.

Optimum arrangement of automatic production lines. Izv.vys. ucheb.zav.; mashinostr. no.9:32-39 '62. (MIRA 16:2)

1. Moskovskoye vysshoye tekhnicheskoye uchilishche imeni Baumana.

(Automation) (Machine tools)

VOLCKO, J.; MUZELAK, R.; IVAN, J.; MELICH, O.; KUDLA, Vl.; LUKACIN, St.

Obstetrical surgery in maternity homes in the region of eastern Slovakia and its relation to perinatal mortality. Cesk. gynek. 29 no.6:545-549 Ag '64.

1. Gyn.-por. klin. Lek. fak. University P.J. Safarika v Kosiciach (prednosta doc. dr. K. Poradovsky, CSc.).

S/137/62/000/002/019/144
A006/A101

AUTHOR: Volchkov, A.

TITLE: Continuous steel casting

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 2, 1962, 45, abstract 2V274 ("Tr. Krasnoyarskogo s.-kh. in-ta", 1960, v. 5, 65-69)

TEXT: Information is given on the process of continuous steel casting, its technical and economical advantages, and the quality of the metal produced. A short description is given of continuous casting units at the Stalino Metallurgical and the "Krasnoye Sormovo" Plants. The expediency is discussed of constructing a metallurgical plant in the region of Yenniseysk using the process of continuous steel casting.

N. Nikolayev

[Abstracter's note: Complete translation]

Card 1/1

FONOMAREV, D.N.; VOLCHKOV, A.A.

Determining the distortion of the Moscow photographic zenith telescope. Soob. GAISH no.134:40-45 '64. (MIRA 17:8)

VOLCHKOV, A.I.

The 54-B-KG electromagnetic cone. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. no.7:8-9 '62. (MIRA 15:7)
(Magnetic separation of ores—Equipment and supplies)

VOLCHKOV, A.K., kand.tekhn.nauk; MOKIN, A.I., inzh.; LOVCHIKOV, V.S., kand. tekhn.nauk

Production of "formovil'd" castings. Lit. proizv. no.7:7-9 Jl '65. (MIRA 18:8)

SOV/128-59-3-25/31

18(5)

AUTHOR: Volchkov, A.K., Docent

TITLE: Cupola Furnace with Open Slag Notch

PERIODICAL: Liteynoye Proizvodstvo, 1959, Nr 3 p 47 (USSR)

ABSTRACT: During the recent years in the Soviet Union as well as in foreign countries a constantly growing interest is shown in the expansion of the cast iron production by using cupola furnaceswith open slag notch. The 20 years of pratice with cupola furnaces with open slag notch have shown that by using the correct technical system and the correct dimensions of the cupola furnace the superheating of the cast iron to between 1,420° and 1,450°C is possible. During 1957 in one of the plants Sovnarkhcz of Krasnoyarsk, at which the closed slag notch method had been used, by dint of great exertion 1.380° to 1.400° C could be reached. Later on the method of the open slag notch had been used without any changes in the work conditions. In this manner it was possible to compare the

Card 1/2

Cupola Furnace with Open Slag Notch

results of both these methods. The author of the article supplies the dimensions of the cupola furnace and gives instructions how to distribute the blast within the cupola furnace. There should be 90% of the blast directed to the upper part of the shaft and 10% only to the fore-hearth.

VOLCHKOV, A.V., assistent

Diagnosis and treatment of giant-cell tumors. Sbor. trud. Kursk. gos. med. inst. no.13:306-308 '58. (MIRA 14:3)

1. Iz kliniki fakul'tetskoy khirurgii (zav. - prof. M.G.Ruditskiy) Kurskogo gosudarstvennogo meditsinskogo instituta.
(TUMORS)

VOLCHKOV, A.V.

Giant-cell tumors. Khirurgiia 35 no. 11:72-78 N '59. (MIRA 14:1)
(TUMORS)

VOLCHKOV, A. V., Cand Med Sci -- "Data for the diagnosis of osteogenetic sarcomata and giant-cell tumors of bones." Mos, 1961. (State Sci Res Roentgeno-Radiol Inst, Min of Health RSFSR) (KL, 8-61, 259)

VOLOSHKOV, A. V.

Rare case of a vesico-intestinal fistula. Khirurgiia Supplement: 40-41 '57. (MIRA 11:4)

1. Iz fakul'tetskoy khirurgicheskoy kliniki Kurskogo meditsinskogo instituta.
(FISTULA) BLADDER--DISEASES)
(INTESTINES--DISEASES)